

Claims

1. Oil wiping ring ring groove arrangement for pistons of internal combustion engines, having a lamella (1) provided with parallel walls, whose working surface (h) has a barrel-shaped asymmetrical shape, having a vertex line (3) that extends over the circumference of the lamella, whereby the lamella is disposed in a ring groove (7) of the piston, having one ring groove wall (6) facing away from the piston crown side and one ring groove wall (5) facing the piston crown side,

characterized in that

at least one of the ring groove walls (5, 6) runs at a slant radially outward up to the outside piston diameter, at an angle (α , β) relative to the piston axis (10),

that the working surface (h) of the lamella (1) is configured in such a manner that it corresponds to an almost worn end contour in the run-in engine state, and

that in the assembled state of the oil wiping ring (1) in the piston, the vertex line (3) of the working surface (h) is disposed towards the ring groove wall (6) that faces away from the piston crown side.

2. Oil wiping ring ring groove arrangement according to claim 1, characterized in that the working surface (h) of the lamella (1), in cross-section,

- follows the asymmetrical shape of a polynomial of the second order in a first segment (I), with $h(x) = ax + bx^2$, whereby
 - x = working surface coordinates in the Cartesian coordinate system in mm, and a , b are coefficients, with a being defined by the ratio of the axial wall play of the lamellae relative to the width of the lamellae; b being defined as the amount of the working surface curvature;
 - a supporting vertex (II) $h(x=0)$ configured as an edge, and
 - in a third segment (III) follows the asymmetrical shape of the function $h(x) = cx^2$, with c as a multiple of b .
3. Oil wiping ring ring groove arrangement according to claim 1 and 2, characterized in that the ring groove wall (6) facing away from the piston crown side runs at a slant away from the piston crown, at an angle (β).
 4. Oil wiping ring ring groove arrangement according to claim 1 and 2, characterized in that the ring groove wall (5) facing the piston crown side runs at a slant towards the piston crown, at an angle (α).
 5. Oil wiping ring ring groove arrangement according to claim 1 and 2, characterized in that two lamellae (1, 1') are

disposed lying loosely on top of one another in the ring groove (7) with a ring groove base height (H), whereby the ring groove base height is configured in such a manner that the angle (β) assumes a value according to the arrangement according to claim 1.

6. Oil wiping ring ring groove arrangement according to claim 5, characterized in that both of the vertex lines (3, 3') are disposed facing towards the ring groove wall (6) facing away from the piston crown side.
7. Oil wiping ring ring groove arrangement according to claim 3, characterized in that the angle α comprises a value of 93 to 98 degrees of angle, and the angle β comprises a value of 85 to 87 degrees of angle.
8. Oil wiping ring ring groove arrangement for pistons of internal combustion engines, having a lamella (1) provided with parallel walls, whose working surface (h) has a barrel-shaped asymmetrical shape, having a vertex line (3) that extends over the circumference of the lamella, whereby the lamella (1) is disposed in a ring groove (7) of the piston, having one ring groove wall (6) facing away from the piston crown side and one ring groove wall (5) facing the piston crown side,
characterized in that

the ring groove walls (5, 6) are disposed at a slant radially outward up to the outside piston diameter, at an angle α and β relative to the piston axis (10), in each instance, in such a manner that ring groove wall (6) that faces away from the piston crown side is inclined away from the piston crown, and the ring groove wall (5) that faces the piston crown side runs at a slant towards the piston crown;

that the working surface (h) of the lamella (1) corresponds to an almost worn end contour in the run-in engine state; and

that in the assembled state of the oil ring (1) in the piston, the vertex line (3) of the working surface (h) is disposed towards the ring groove wall (6) that faces away from the piston crown side.

9. Oil wiping ring ring groove arrangement according to claim 7, characterized in that the working surface (h) of the lamella (1), in cross-section,

- follows the asymmetrical shape of a polynomial of the second order in a first segment (I), with $h(x) = ax + bx^2$, whereby

x = working surface coordinates in the Cartesian coordinate system in mm, and a , b are coefficients, with a being defined by the ratio of the axial wall play of the lamellae relative to the width of the lamellae; b being defined as the amount of the working surface curvature;

- a supporting vertex (II) $h(x=0)$ configured as an edge, and
- in a third segment (III) follows the asymmetrical shape of the function $h(x) = cx^2$, with c as a multiple of b .